DOCUMENT RESUME

ED 247 707 EC 170 062

AUTHOR Hyde, Merv; And Others
TITLE Use of Verbal and Non-Verbal Control Techniques by Mothers of Hearing-Impaired Infants.
PUB DATE Jun 81
NOTE 35p.; Paper presented at a Seminar on Early Intervention for Young Hearing-Impaired Children (Mt. Gravatt, Queensland, Australia, June 15-16, 1981). For the proceedings, see EC 170 057.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Hearing Impairments; Infants; *Interaction; Mothers; *Nonverbal Communication; Parent Child Relationship; *Verbal Communication

ABSTRACT

The interaction of 12 hearing-impaired children (13-16 months old) and their caregivers was examined. Videotapes of mother-child interactions were recorded during play with a range of toys. Analysis focused on mothers' attention controls, action controls, prohibitives, imperatives, and interrogatives as well as nonverbal controls. Results revealed that mothers' verbal controls were more likely to be related to an initiative taken by the mother than to one taken by the child. This compared to previous data showing mothers of hearing children follow an initiative taken by their infants more than 60% of the time. There was no significant difference between the incidence of maternal initiation of attention versus child initiation for either age group (15 months or 25 months). Mothers of the older group, however, spent less time attempting to gain the attention of their children. Grammatical analysis revealed no significant difference between mothers' language addressed to younger or older children. Examination of nonverbal control techniques revealed that mothers were more directive than prohibitive for both age groups and that mothers of both age groups used more manipulative controls than gestures. (CL)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

# USE OF VERBAL AND NON-VERBAL CONTROL TECHNIQUES BY MOTHERS OF HEARING-IMPAIRED INFANTS

by

Merv HYDE

Gordon ELIAS

and

Des POWER

Centre for Human Development Studies

Mt. Gravatt College of Advanced Education

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
D J Power
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED247707

EC 170 062

## INTRODUCTION

Much of the literature concerned with children's early development has centred on the concept of "attachment" (Ainsworth, 1974; Bowlby, 1979; Schaffer, 1971), although a more recent approach in the study of early development has given emphasis to the *interactive* quality of early social behavior (Schaffer, 1977). This involves viewing the mother-child relationship as a dynamic system in which both partners play a part in achieving mutual synchrony. Researchers now ask questions concerning the relative contributions of each partner and the characteristics of the relationship at different stages of development. A major focus in this respect has been the examination of the language used by caregivers to their young children.

The importance in the language acquisition process of mothers' speech to young children has been well established, as has the fact that it is different from mothers' speech to adults in several ways (Glanzer & Dodd, 1975; Phillips, 1973; Snow, 1972; Snow & Ferguson, 1976). Speech to young children is simplet in vocabulary and syntax, consists of shorter utterances spoken at a slower rate, is hignly redundant and possesses specific intonation contours.

Given the undoubted significance of the linguistic behavior of the caregiver (Lewis and Freedle, 1972; Nelson, 1973) for children's language acquisition, the scarcity of research into the interactions of mothers with their handicapped children is a source of concern to

practitioners in special education (Moores, 1976). Mothers whose children have handicapping conditions such as language delay and mental retardation show some differences in the amount and type of communication situations under which they communicate with their children as compared to the data on normal children and their caregivers (Bondurant, 1977; Buium, Rynders & Turnure, 1974; Wulbert, Inglis, Kreigsmann & Mills, 1975).

Buium et al. (1974) point out that the linguistic environment provided by the caregivers of Down's Syndrome children is different in terms of the frequency of occurrence of a number of linguistic parameters, including use of imperative sentences and Wh- type questions, when compared with maternal language provided for age-matched normal children. However, Turnure and Rondal (1976) found that Down's Syndrome children matched for language development with younger normal children were exposed to similar language environments by their caregivers. In a further study of the language used by mothers of Down's Syndrome children, Buckhalt, Rutherford and Goldberg (1978) reported that maternal speech did not change between nine months and twenty-four months of age. This was supported by Gunn, Clark & Berry (1980) who, in a longitudinal study of one child from 3.7 to 17 months of age, found no differences in the complexity of mother's language as measured by mean length of utterance. They did, however, note differences in the frequency of object referencing and "direction" (i.e., by the mother in interacting with her child as his age increased). Their findings, in conjunction with those of Marshall, Hegrenes, and Goldstein (1973) indicate a marked change in the direction variable which, in the light of Nelson's (1973) study, would seem to be negatively correlated with subsequent level of language development of the child. Further, if Nelson (1973) is correct about the impeding effects of that mismatching of maternal and infant communication style on oral language development of normally hearing infants, then it is certainly possible that the communication mismatching between handicapped children and their parents could have serious repercussions for language development.

Further consideration of this possibility as far as hearing-impaired infants and their mothers are concerned is limited by the small number of studies that have examined maternal speech to hearing-imapired children (Brinich, 1980).

Seitz and Marcus (1976) in a study of one twenty-month-old hearing-impaired child, using Mean Length of Utterance (MLU) and frequency of Wh-questions ad indices of the complexity of the mother's speech, noted that although the mother's MLU seemed appropriate, her speech was heavily weighted with directives and lacked developmentally appropriate Wh-questions. They expressed concern regarding the "excessive intrusion (p. 449)" demonstrated by mothers who were over-concerned with ensuring verbal input, and concluded that this situation might best be improved by the mother addressing her language to child-initiated activities and thus capitalizing on the child's attention and motivation.

Seitz and Marcus' findings are supported by Collins (1969) who found that mothers of hearing-impaired children communicate mainly to direct the activities of their children, and by Goss (1970) who compared the language used by twenty mothers to their hearing-impaired preschoolers to that used by other mothers to their young hearing children. Goss found that the mothers of the hearing-impaired children were more likely to show disagreement, tension, and antagonism and to give more suggestions and to ask fewer questions. Anderson (1978), in a detailed study of three families with hearing-impaired children, with an age range of 4.5 to 32 months, reported findings which were at variance with these studies. She concluded that the speech addressed by the caregivers to the hearing-impaired children was "strikingly similar (p. 241)" to the data presented by Snow (1977) in her study of two normally hearing children. This assertion was based on measures of the occurrence of maternal speech of questions, imperatives, referential features, repetition of content, and mothers' attempts to elicit responses from their children.

Cross (1980), however, as a result of a study of maternal speech to hearing-impaired children from 25 to 70 months, disagreed with Anderson (1978) on the basis of examination of her measures of complexity of maternal utterance, use of prepositions, use of vocatives, imperatives and questions, the grammaticality of utterances, and references to the child. A comparison of these measures of maternal speech to hearing and hearing-impaired children of two years of age led her to conclude that "mothers speaking to hearing two-year-olds address them differently from

hearing-impaired children matched either for age or level of spontaneous language use (p. 23)." In relation to such maternal speech differences Cross further concluded that they are specifically determined by the receptive abilities of the child and that such "aberrant speech adjustments could be expected for mothers of deaf children of all ages (p. 27)."

The findings of Cross (1980) are supported by those of Wedell-Monnig and Westerman (1977) who, in an examination of the language of mothers to six hearing and to six deaf 13- to 20-month-olds, observed that the mothers of the hearing infants used more complex language than the mothers of the hearing-impaired infants (as measured by MLU). They also noted that the mothers of the hearing children used significantly more interrogatives, but did not observe any differences in the use of imperatives or declaratives when they were compared with the mothers of the deaf infants. Like Cross (1980), they concluded that the less complex speech of the mothers of the hearing-impaired group appeared to be a function of the feedback from their children and that continued feedback of noncomprehension served to keep maternal speech at a very simple level.

All of the above studies are primarily concerned with mothers' speech addressed to their young hearing-impaired children Other important aspects of mother-child interaction concomitant with childhood deafness have been noted by Schlesinger and Meadow (1972) and Brinich (1980). The study of Schlesinger and Meadow is one of few developmental studies of hearing-impaired children in that the interaction patterns of mothers and their hearing-impaired children were observed at 3½, 5½ and 7½ years of age. Their sample included 40 hearing-impaired preschoolers and a comparison group of 20 age- and sex-matched hearing children. In free play situations with their children, mothers were rated on a number of dimensions of their behaviour, of their children's behaviour, and of behaviour in reciprocal mother-child interactions.

Their findings led them to conclude that the behaviour of mothers of hearing-impaired children differed greatly from that of the mothers of hearing children and that the mothers of the former group were "more likely to appear inflexible, controlling, didactic, intrusive and disapproving (p. 107)." Schlesinger and Meadow identify the problems

faced by many mothers in gaining the attention of their hearing-impaired children and point out that the methods used to achieve this may well have to be intrusive, authoritarian, or overly controlling.

Brinich (1980) augmented the coding scheme for maternal behaviours used by Schlesinger and Meadow (1972) to make it a more objective measure of 55 categories of maternal and child behaviour that he sought to define as "discrete behavioural events (p. 76)." He based his scheme on earlier work by Marvin and Bates (1971) and Watzlavick, Beavin and Jackson (1967) which permits coding of both verbal and non-verbal behaviour. These authors made the assumption that communication between mother and child occurs in both verbal and non-verbal modes simultaneously and that these two modes are able to convey parallel information. In his study of mothers of 40 hearing-impaired and 20 hearing children from 5½ to 6½ years of age, Brinich (1980) found that the mothers of the hearing-impaired group used significantly more behaviours related to gaining the child's attention than did the mothers of hearing children and, although there were no differences between the groups in terms of the use of maternal statements, the mothers of the hearing-impaired children used significantly more questions and instructions. Whilst Brinich admitted the low reliability of some of the categories of his coding scheme, he felt able to conclude that when mothers encounter difficulty in establishing reciprocal communication with their hearing-impaired children, they may adapt to that situation by assuming control of the relationship.

In summary, studies of the verbal (Collins, 1969; Goss, 1970; Schlesinger & Meadow, 1972; Seitz & Marcus, 1976; Wedell-Monnig et al., 1977) and non-verbal behaviour (Schlesinger & Meadow, 1972; Brinich, 1980) of the mothers of young hearing-impaired children conclude that they are more directive and controlling in their interactions with their children than are mothers of age-matched hearing children. There is, however, no detailed information available on the specific nature of the control techniques utilized by mothers in their interactions with their young hearing-impaired children, particularly in terms of their separate verbal and non-verbal behaviours, their degree of directiveness of child attention and activity, and changes over time on these dimensions.

For this reason, the purpose of this study is to utilize the procedure for analysis of maternal control techniques outlined by Schaffer and Crook (1978) to examine the interactions of mothers with their young hearing-impaired children at 15 and 24 months. Such examination will permit some comparison to the data on age-matched hearing children collected by Schaffer and Crook (1978) and, in addition, will allow more detailed observation of the maternal control techniques used by hearing-impaired children than has been previously possible. Further, changes in maternal control technique as a function of the age of the hearing-impaired child, will also be investigated.

## THE STUDY

Schaffer and Crook (1978), in a study of mother-infant dyads involving children aged 15 and 24 months respectively, examined the nature of the techniques with which mothers directed their children's behaviour in a situation where the mothers were asked to take an assertive role. (In a free play situation with a number of toys the mother was asked to encourage her child to play with as many of the toys as possible.) The authors define control techniques as those methods employed by the adult with the aim of changing the child's focus of attention, modifying or maintaining his activity, and determining the grammatical form of the mother's speech when addressing the child. All classificatory distinctions, with one exception, were made at both verbal and non-verbal levels. In the case of the grammatical form of the mother's speech, the only distinction made non-verbally was between her use of gesture and actual manipulation of an object or the child.

Subsequent analysis of the mothers' behaviour led Schaffer and Crook (1978) to conclude that for the younger group 60% and older group 74% of the mothers' verbal controls occurred after the child itself had initiated a change of attention to another toy. They noted that with increasing age the child was more likely to initiate such toy shifts himself without the mother having to verbally direct him to do so. However when the mother did initiate a toy shift, in most instances (87% and 79% respectively), the shift was attempted with a verbal control that was intended to redirect the child's attention rather

than to direct his activity. Direction of activity was reserved until attention had been gained. They also noted that the mothers of the younger group used twice as many verbal controls of attention as did the mothers of the older group. There was no difference observed for the mothers' use of controls of activity between the two groups. Their final conclusion is noteworthy in emphasizing that even in a situation where the mother was asked to be more assertive in her interactions with her child, evidence for mutuality was still found.

The importance of this study relates not only to the results obtained but to the coding scheme developed, which allows simultaneous verbal and non-verbal classifications of the caregiver's behaviour on a number of discrete levels. It has particular importance in the examination of the interactions of mothers and their hearing-impaired children for the following reasons:

(i) If previous authors (Collins, 1969; Schlesinger & Meadow, 1972; Brinich, 1980) are correct in asserting that mothers of hearing-impaired children are more directive and controlling in their relationships with their children then the task, situation and coding scheme used by Schaffer and Crook (1978), provide a valuable means by which this might be further investigated.

(ii) In addition more precise information on the nature of the control techniques used by such caregivers could be obtained. Measures made in both verbal and non-verbal modes at a number of levels could give further specific insight into the effects of childhood deafness on the mother-child relationship.

(iii) The age groups involved in the study allow observation of a group of hearing-impaired children who are younger than those involved in previous studies (Schlesinger & Meadow, 1972; Brinich, 1980). Further, collection of data on the behaviour of mothers of the two age groups makes it possible to examine changes in the mothers' behaviour over time.

(iv) The measures of the grammatical form of the mothers' verbal controls can be considered in relation to the conflicting findings of previous studies (Gunn et al., 1980; Anderson, 1978; Cross, 1980).

(v) The data collected by Schaffer and Crook (1978) provide a basis for comparison to the interactions of normally hearing infants and their caregivers.

For these reasons the age groups, task, situation and behavioural classification scheme used by Schaffer and Crook (1978) will be followed in this study in examining the interactions of hearing-impaired children with their caregivers.

Subjects

In the study twelve mother-child dyads were observed. The children comprised the entire known hearing-impaired population between thirteen and sixteen and between twenty-three and twenty-five months of age in Brisbane and Sydney, according to the records of the National Acoustics Laboratory and the respective State Education Departments.

The children were,

(i) severely and profoundly, pre-lingually hearing-impaired (i.e., a hearing loss averaging 75dB or more as measured at frequencies of 500, 1000, and 2000Hz),

(ii) between 13 months and 16 months (mean = 15 months; SD = 1.78 months) or between 23 and 25 months of age at the time of the study (mean = 24.5 months; S.D. = 0.76 months),

(iii) assumed to be at least normal intellectually by the organizations that catered for them,

(iv) living with intact families, and,

(v) without diagnosed additional handicaps at the time of the study,

(vi) all fitted with binaural hearing aids by a single agency,

(vii) from a variety of programs both state and private, home-based and centre-based, and,

(viii) contained approximately equal numbers of boys and girls.

The mothers,

(i) all consented to participate in the study,

(ii) were native English-speaking (with one exception where English was spoken as a second language),

(iii) used oral or manually supplemented methods of communicating with their children, and,

(iv) nine of the mothers had intact hearing, and three mothers were congenitally hearing-impaired. Two were able to communicate effectively with their children and the investigator by manual signs and finger spelling and the third by oral means alone.

Test Situation

The observational data were collected by videotaping mother-child interactions with a protable video-tape recorder. The camera was positioned so that a clear view of both infant, mother and toys was available at all times. A sensitive microphone was used to ensure all vocalizations were recorded. Ten of the sessions took place at the pre-school/parent guidance centre that the mother attended, two of the sessions at the parent's home and a further two in the recording studio at the Mt. Gravatt College of Advanced Education. The diversity of recording venues was necessitated by the distribution of such mother-infant dyads in Brisbane and Sydney. All of the recording was done by the senior investigator and took place in the two-month period, June - July, 1980. Each mother-child pair was observed for a period of eight minutes, no other adults or children were present during these sessions.

Procedure

The task and situation used by Schaffer and Crook (1978) were followed in that the mother and child were seated on the floor and eight toys placed between them. The range of toys used was considered to be of interest to both males and females of the ages observed. The mother was instructed to encourage her child to play with as many of the toys as possible and not to devote all his time to only one or two of them. This was to ensure that the mother took an active role in the interaction and so highlight her use of control techniques. The mothers were unaware of the exact time sample being used for later analysis but were only informed that their period on camera would be about ten minutes. All video-tape material was subsequently examined by the senior investigator and one assistant. The mothers' utterances were transcribed and detailed descriptions of maternal and child behaviour were made.

Response Measures

Schaffer and Crook (1978) made an initial distinction between non-verbal and verbal behaviour (Figure 1), each of which was further distinguished into behaviours affecting the infant's attention and its activity. Attention controls attempt to focus the child's visual or auditory attention ("Look at the ball!") and thus serve to introduce an object (or a locality) into the sphere of play. The child is expected to identify or locate something, usually as a prelude to an activity. Action controls aim to modify the infant's behaviour by specifying some activity that he is expected to perform, e.g., "Push the dollie!", "Give teddy to Mummy.", "Play with the car."

Both action and attentional controls may be classified as directives or prohibitives; and where directives control behaviour by guiding it into specialized directions prohibitives are designed to terminate or prevent an activity, e.g., "Don't eat teddy!" or to distract the child's attention away from the undesirable activity, e.g., "Look [instead] at this lovely doll!"

Finally, both directives and prohibitives are represented by different grammatical forms which may be an imperative ("Throw me the ball"), an interrogative ("Where's teddy?"), a declarative which

is in the manner of an embedded imperative, e.g., "I think its over there" and moodless statement which is inserted into the child's ongoing activity in order to modify its progress ("Careful!", "Gently").

FIGURE 1

CLASSIFICATION OF VERBAL CONTROL TECHNIQUES

| | | | |
|---|---|---|---|
| Verbal Controls | Attention | directives | imperatives<br>interrogatives<br>declaratives<br>moodless |
| | | prohibitives | imperatives<br>interrogatives<br>declaratives<br>moodless |
| | Action | directives | imperatives<br>interrogatives<br>declaratives<br>moodless |
| | | prohibitives | imperatives<br>interrogatives<br>declaratives<br>moodless |

(Schaffer and Crook, 1978, p. 68)

Non-Verbal controls again involve the distinction between those seeking the infant's attention and those attempting to change its activity. However, in this case, an additional distinction between gestures and manipulatives has to be made. Gestures generally do not involve contact and are symbolic in nature whereas manipulatives entail an action, bringing the infant into direct contact with the object. Such manipulatives may involve locating the object or toy in front of the child, demonstrating its function, or attracting the infant's attention by moving it (Figure 2).

FIGURE 2

CLASSIFICATION OF NON-VERBAL CONTROL TECHNIQUES

| | | | |
|---|---|---|---|
| Non-Verbal Controls | Attention | directives | gestures<br>manipulatives |
| | | prohibitives | gestures<br>manipulatives |
| | Action | directives | gestures<br>manipulatives |
| | | prohibitives | gestures<br>manipulatives |

(Schaffer and Crook, 1978, p. 72).

The analysis made by Schaffer and Crook involved the determination of how attention to a particular toy was initiated. To do this they examined the first maternal utterance that referred to a toy not referred to in previous utterances, and then considered what the child was doing at the time. This analysis demonstrated whether the mother was initiating the change of attention or whether she was following a child-initiated choice. The following example from Child Number 1 at 25 months demonstrates this.

FIGURE 3

ANALYSIS OF INITIATION OF ATTENTION CHANGE

| Mother's Speech | Description of Activity |
|---|---|
| What's this?/Look/ | Child plays with telephone.<br>Mother picks up plane<br>Child looks and mother demonstrates flying action |
| Brrr . . . . . ./ | |
| Can you fly the plane?/ | Child takes toy.<br>Child play briefly with plane and then picks up keys which he holds up for mother to see. |
| Keys?/ | |
| Put in and turn around/ | |

In this case, attention to the first toy (plane) was initiated by the mother but to the second toy (keys) by the child. The number of mother- and child-initiated toy shifts were tallied for the eight minute sample for each dyad (Level 1: verbal and non-verbal). In the cases where the mother initiated the toy shift the actual verbal control techniques used was recorded. In the example previously given it was with a verbal attentional control although there were instances where the mother used a verbal action control, e.g.,

FIGURE 4

ANALYSIS OF INITIATION OF ATTENTION CHANGE

| Mother's Speech | Description of Activity |
|---|---|
| | Child watches mother. Mother chooses a toy, demonstrates its features and holds it out to child. |
| Put together?/ | |

Complete recording of all maternal utterances were made in terms of their controlling the child's attention or action (Level 2), whether they were prohibitive or directive (Level 3) and their grammatical form (Level 4). The same levels were used in the non-verbal modality to record mothers' behaviour with the exception of level 4 which recorded her use of gestures and manipulatives.

## Analyses of Data

All of the data were subjected to non-parametric statistical analysis due to the small sample size, the large variation of the observed frequencies of particular maternal behaviours, and doubtful likelihood of normality in the distribution of the data. Additionally, all the data were ranked so that only assumptions of ordinality were made. The Mann-Whitney-U Test was used for all between- (age)-group comparisons. The Wilcoxon Matched Pairs Signed-Ranks Test was used for all within-group comparisons as it was considered that repeated measures of a mother's behaviour constituted related samples.

Inter-rater reliability estimates of judgments of utterances, toy shifts, and control technique classifications were performed. The two raters scored three one-minute samples from different dyads and the reliability estimates were computed.

## RESULTS

The analysis of data collected indicates that mothers' verbal controls directed at the hearing-impaired children studied are more likely to be related to an initiative taken by the mother. They are less likely to follow an initiative taken by the child. For both the younger and older children, only 40% of these maternal controls occur after the child chooses a toy and 60% are initiated by mother (Table 1). In the case of the hearing children observed by Schaffer and Crook (1978) the percentage of child-initiated are 60 and 74 for their younger and older groups respectively.

### TABLE I

### Number and Percent of "Toy Shifts" Initiated by Mother and by Child

| Subjects | Mother-initiated | | | | | | Child-initiated | | | | | | Total "Toy Shifts" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 mths | | 25 mths | | Total | | 15 mths | | 25 mths | | Total | | | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| 1 | 12* | 92 | 17 | 52 | 29 | 63 | 1* | 8 | 16 | 48 | 17 | 37 | 46 | 100 |
| 2 | 19 | 58 | 17* | 59 | 36 | 58 | 14 | 42 | 12* | 41 | 26 | 42 | 62 | 100 |
| 3 | 9 | 28 | 23* | 66 | 32 | 48 | 23 | 72 | 12* | 34 | 35 | 52 | 67 | 100 |
| 4 | 12 | 86 | 18 | 75 | 30 | 79 | 2 | 14 | 6 | 25 | 8 | 21 | 38 | 100 |
| 5 | 9 | 64 | 34 | 83 | 43 | 78 | 5 | 36 | 7 | 17 | 12 | 22 | 55 | 100 |
| 6 | 15 | 88 | 9 | 26 | 24 | 46 | 2 | 12 | 26 | 74 | 28 | 54 | 52 | 100 |
| Total | 67 | 60 | 118 | 60 | 194 | 60 | 45 | 40 | 79 | 40 | 126 | 40 | 32 | 100 |
| Mean | 11.2 | | 19.7 | | 16.2 | | 7.5 | | 13.2 | | 10.5 | | | |

*Hearing-impaired mother.

It would seem then, that whereas mothers of hearing children follow an initiative taken by their infants more than 60% of the time, this

was reversed for mothers of hearing-impaired children who take more of the initiative themselves for both age groups observed. There is, in fact, no significant difference between the incidence of maternal initiation of attention vs child initiation for either age group of hearing-impaired children ($T = 3$). Further, the mothers of the older group are no more likely to allow their children initiative than the mothers of the younger group ($U = 10$).

Table 2 provides data on maternal use of verbal controls, whether attention or action. As can be seen, the mothers of the hearing-impaired children of fifteen months use significantly more verbal attention controls than do the mothers of the older hearing-impaired children ($U = 2$; $p = .004$; based upon rank ordered data because of the biasing effect of no vocal communication by two of the hearing-impaired mothers). This is in the same direction as the difference noted by Schaffer and Crook (1978). Additionally, as in their study there is no change in the frequency of the use of maternal action controls across the two age groups ($U = 10$; $p = .12$).

TABLE II

Number and Percent of Mothers Utterances (Verbal) which were Directed to Modifying the Child's Attention or Action.

| Subjects | Attention Controls | | | | | | Action Controls | | | | | | Total Verbal Controls | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 mths | | 25 mths | | Total | | 15 mths | | 25 mths | | Total | | | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| 1 | 59* | 72 | 28 | 36 | 87 | 54 | 23* | 28 | 50 | 64 | 73 | 46 | 160 | 100 |
| 2 | 89 | 58 | 0* | 0 | 89 | 58 | 65 | 42 | 0* | 0 | 65 | 42 | 154 | 100 |
| 3 | 36 | 71 | 0* | 0 | 36 | 71 | 15 | 29 | 0* | 0 | 15 | 29 | 51 | 100 |
| 4 | 106 | 35 | 55 | 63 | 161 | 42 | 194 | 65 | 32 | 37 | 226 | 58 | 387 | 100 |
| 5 | 70 | 37 | 43 | 34 | 113 | 36 | 120 | 63 | 84 | 66 | 204 | 64 | 317 | 100 |
| 6 | 79 | 53 | 26 | 45 | 105 | 50 | 71 | 47 | 32 | 55 | 103 | 50 | 208 | 100 |
| Total | 439 | 74 | 152 | 26 | 591 | 46 | 488 | 71 | 198 | 29 | 686 | 54 | 1277 | |
| Mean | 73 | | 25 | | 49 | | 81 | | 33 | | 57 | | | |

*The mother of Child 1 was the only deaf mother who attempted to communicate verbally (vocally or non-vocally) with her child.

When the mothers initiate a toy shift themselves, they, like the mothers of hearing children, are more likely to do so with an attentional control rather than an action control. This situation obtains for both groups observed. For the 15 month and 25 months groups respectively the Wilcoxon $\underline{T} = 0$ ($p = 0.025$) and $\underline{T} = 1$ ($p = 0.0$) for verbal control and for both groups for $\underline{T} = 0$ ($p - 0.025$) non-verbal control (50% in both cases). There are thus no between-group differences on this measure (Table III).

TABLE III

Number and Percent (%) of Attentional and Action Controls when Mother Initiated a Toy Shift

| | Verbal | | | | | Non-Verbal | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 mths | | 25 mths | | Total | 15 mths | | 25 mths | | Total | |
| Subject | Action | Attention | Action | Attention | | Action | Attention | Action | Attention | | |
| 1 | 1(20)* | 4(80)* | 8(53) | 7(47) | 20 | 2(15)* | 11(85) | 7(44) | 9(54) | 29 | 49 |
| 2 | 2(12) | 15(88) | 0(0)* | 0(0)* | 17 | 2(12) | 15(88) | 1(7)* | 13(93) | 31 | 48 |
| 3 | 2(25) | 6(75) | 0(0)* | 1(100)* | 9 | 1(11) | 8(89) | 6(30)* | 14(70) | 29 | 38 |
| 4 | 1(13) | 7(87) | 1(8) | 11(92) | 20 | 3(38) | 5(62) | 3(25) | 9(75) | 20 | 40 |
| 5 | 5(38) | 8(62) | 1(38) | 18(62) | 32 | 6(46) | 7(54) | 6(25) | 19(76) | 38 | 70 |
| 6 | 2(13) | 13(87) | 1(11) | 8(89) | 24 | 4(40) | 6(60) | 1(13) | 7(87) | 18 | 42 |
| Total | 13(20) | 53(80) | 21(32) | 45(68) | 112(43) | 18(26) | 52(74) | 24(25) | 71(75) | 165(57) | 287 |
| Mean | 2.2 | 8.3 | 3.5 | 7.5 | | 3 | 8.7 | 4 | 11.8 | | |

*Mother was hearing-impaired.

At the non-verbal level no significant differences were noted between the use of controls of attention and controls of action for either age group (Table IV).

TABLE IV

Number and Percent of Non-Verbal Behaviors which were Directed towards Modifying the Child's Attention or Action.

| Subjects | Attention Controls | | | | | | Action Controls | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 mths | | 25 mths | | Total | | 15 mths | | 25 mths | | Total | | | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| 1 | 37* | 42 | 21 | 38 | 58 | 41 | 48* | 58 | 35 | 42 | 83 | 59 | 141 | 100 |
| 2 | 28 | 51 | 23* | 62 | 51 | 55 | 27 | 66 | 14* | 34 | 41 | 45 | 92 | 100 |
| 3 | 25 | 61 | 17* | 60 | 42 | 61 | 16 | 70 | 11* | 30 | 27 | 39 | 69 | 100 |
| 4 | 29 | 19 | 36 | 54 | 65 | 29 | 126 | 80 | 21 | 20 | 157 | 71 | 222 | 100 |
| 5 | 32 | 33 | 35 | 51 | 67 | 40 | 65 | 66 | 34 | 34 | 99 | 60 | 166 | 100 |
| 6 | 25 | 29 | 18 | 41 | 43 | 33 | 62 | 70 | 26 | 30 | 88 | 67 | 131 | 100 |
| Total | 176 | 34 | 150 | 80 | 326 | (40) | 344 | 66 | 151 | 50 | 495 | (60) | 821 | 100 |
| Mean | 29.3 | | 25 | | 27.2 | | 57.3 | | 25.2 | | 413 | | | |

*Hearing-impaired mother.

Other comparisons between the groups indicate that there are no significant differences ($U = 9$; $p = .09$) between mothers' use of verbal directive controls at 15 months and 25 months, that is, they are equally directive for children of both ages. They are, however, more non-verbally directive for the younger group ($U = 5$; $p = .02$). In terms of their use of verbal and non-verbal prohibitives there are no significant differences between the groups ($U = 9$ and $U = 10.5$), indicating that mothers' use of such controls does not change over the age range observed (Table V).

## TABLE V

### Mothers' Verbal and Non-Verbal Controls Classified as Directoves and Prohibitives

| Subject | VERBAL | | | | | | NON-VERBAL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 mths | | 25 mths | | Total | | 15 mths | | 25 mths | | Total | |
| | Directive | Declarative | Directive | Declarative | Directive | Declarative | Directive | Declarative | Directive | Declarative | Directive | Declarative |
| 1 | 58* | 1 | 93 | 3 | 151 | 4 | 101* | 3 | 53 | 3 | 154 | 6 |
| 2 | 143 | 7 | 1* | 0 | 144 | 7 | 52 | 10 | 43* | 2 | 95 | 12 |
| 3 | 97 | 0 | 3* | 0 | 100 | 0 | 61 | 0 | 28* | 0 | 89 | 0 |
| 4 | 264 | 3 | 107 | 2 | 371 | 5 | 154 | 20 | 77 | 4 | 231 | 24 |
| 5 | 153 | 22 | 173 | 6 | 326 | 28 | 100 | 11 | 64 | 12 | 164 | 23 |
| 6 | 149 | 7 | 92 | 0 | 240 | 7 | 84 | 7 | 51 | 0 | 153 | 7 |
| Total | 858 | 40 | 469 | 11 | 1132 | 51 | 552 | 51 | 316 | 21 | 868 | 72 |
| Mean | 143 | 6.7 | 78.2 | 1.8 | 47.2 | 2.1 | 92 | 8.5 | 52.7 | 3.5 | 36.2 | 3 |

*Hearing-impaired mother

Level 4 recorded the number of maternal utterances that were imperatives, interrogatives, declaratives or moodless (Table VI), and non-verbally, the number of maternal behaviours that were classified as gestures and manipulatives (Table VII). The mothers' use of imperatives, interrogatives, declaratives and moodless statements for the younger group was compared to these forms for the older group (Table VI) and no significant differences were noted ($\underline{U}$ = 9, 12, 11 and 15).

TABLE VI

Number of Mothers' Utterances Classified as Imperatives, Interrogatives, Declaratives and Moodless

| Subjects | Imperative | | | Interrogative | | | Declarative | | | Moodless | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 mths | 25 mths | Total | 15 mths | 25 mths | Total | 15 mths | 25 mths | Total | 15 mths | 25 mths | Total | |
| 1 | 23* | 41 | 64 | 10* | 15 | 25 | 23* | 15 | 38 | 3* | 25 | 28 | 155 |
| 2 | 97 | 0* | 97 | 23 | 1* | 24 | 21 | 0* | 21 | 9 | 0* | 9 | 151 |
| 3 | 30 | 0* | 30 | 18 | 1* | 19 | 43 | 2* | 45 | 6 | 0* | 6 | 100 |
| 4 | 213 | 51 | 264 | 17 | 14 | 31 | 31 | 29 | 60 | 6 | 15 | 21 | 376 |
| 5 | 29 | 73 | 102 | 24 | 37 | 61 | 16 | 40 | 56 | 0 | 23 | 23 | 242 |
| 6 | 80 | 17 | 97 | 46 | 30 | 76 | 62 | 24 | 86 | 27 | 21 | 48 | 307 |
| Total | 472 | 182 | 654 | 138 | 98 | 236 | 196 | 116 | 312 | 51 | 84 | 135 | 1331 |
| Mean | 78.7 | 30.3 | 54.5 | 23 | 16.3 | 19.7 | 32.7 | 19.3 | 26 | 8.5 | 14 | 11.3 | 221.8 |

*Hearing-impaired mother.

In terms of the mothers' use of gestures and manipulatives no significant difference was observed between the two groups for the use of gestures ($\underline{U}$ = 17.5) but the mothers of the younger group used more manipulatives ($\underline{U}$ = 2.5; $\underline{p}$ = 0.006) than the mothers of the older groups (Table VII). The within-group comparison of gestures to manipulatives demonstrated that the mothers of both groups used significantly more manipulation than gesture ($\underline{T}$ = 0; $\underline{p}$ = .025) for both comparisons.

TABLE VII

Number of Mothers' Non-Verbal Behaviors Classified as Gestures and Manipulatives

| Subject | Gestures | | | Manipulatives | | | Total |
|---|---|---|---|---|---|---|---|
| | 15 mths | 25 mths | Total | 15 mths | 25 mths | Total | |
| 1 | 41 | 18 | 59 | 63 | 38 | 101 | 160 |
| 2 | 7 | 51* | 12 | 55 | 40* | 95 | 107 |
| 3 | 0 | 0* | 0 | 61 | 28* | 89 | 89 |
| 4 | 4 | 19 | 23 | 170 | 62 | 232 | 255 |
| 5 | 10 | 21 | 31 | 74 | 55 | 129 | 160 |
| 6 | 22 | 11 | 33 | 73 | 40 | 113 | 146 |
| Total | 84 | 74 | 158 | 496 | 263 | 759 | 917 |
| Mean | 13.8 | 12.3 | 13.2 | 82.7 | 43.8 | 63.3 | |

*Hearing-impaired mother.

Other within-group comparisons also revealed differences. For the 15-month-group, mothers used significantly more imperative statements than interrogatives or moodless comments ($T = 0$; $p = .025$ for both comparisons). Similarly, the mothers' use of interrogatives and declaratives exceeded their use of moodless statements ($T = 0$; $p = .025$ for both comparisons). There were, however, no significant differences noted between the use of imperatives and declaratives or between interrogatives and declaratives ($T = 2.5$ and $T = 3$). For the 25-month-old group, there were no significant differences in the mothers' use of any of the observed grammatical forms ($T = 6, 5, 3, 6, 5, 7$ and 4 respectively).

As a final point of interest comparisons of the three hearing-impaired mothers and the nine hearing mothers were also attempted. For the verbal measures of all levels, this was not possible as two of the three deaf mothers did not use any verbal language (vocally or non-vocally) during the observed interactions. For all non-verbal levels, however, no significant differences were noted, but this could well be due to the small sample obtained.

As previously described, inter-rater reliability estimates of the two coders were obtained and indicated a high degree of consistency. They were as follows,

| | | |
|---|---|---|
| (i) | utterance judgments | 0.92 |
| (ii) | toy shift judgments | 0.90 |
| (iii) | control technique classifications | 0.89 |

The following summary tables show when significance (at at least the 5% level) obtained for between-group and within-group comparisons. Table VIII presents in summary the statistical comparisons of the 15 months group and the 25 month on all of the Levels recorded.

TABLE VIII

Comparisons of 15 months group and 25 month group on Levels 1, 2, 3 and 4 using Mann-Whitney U test.

| Significance of Result | | Comparison | | Level |
|---|---|---|---|---|
| $U$ = 10.5 | | Mother Initiated "Shift" | | |
| $U$ = 10 | | Child Initiated "Shift" | | 1 |
| $U$=2; $p$=.004 (15m>25m) | Verbal | Attention Controls | | |
| $U$ = 10 | Non-Verbal | | | |
| $U$ = 10 | Verbal | Action Controls | | 2 |
| $U$ = 7 | Non-Verbal | | | |
| $U$ = 9 | Verbal | Directive Controls | | |
| $U$=5; $p$=.021 (15m>25m) | Non-Verbal | | | |
| $U$ = 9 | Verbal | Prohibitive Controls | | 3 |
| $U$ = 10.5 | Non-Verbal | | | |
| $U$ = 9 | Imperatives | | | |
| $U$ = 15 | Interrogatives | | Verbal | |
| $U$ = 11 | Declaratives | | | |
| $U$ = 15 | Moodless Statements | | | |
| $U$ = 17.5 | Gestures | | Non-Verbal | 4 |
| $U$=2.5; $p$=.006 (15m>25m) | Manipulatives | | | |

TABLE IX

Comparisons of Mothers' Verbal and Non Verbal Behaviours at Levels 1, 2, 3 and 4 for each of the Age Groups (Wilcoxon Matched Pairs Signed - Ranks Test)

| 25m GROUP | 15m GROUP | COMPARISON | LEVEL |
|---|---|---|---|
| T = 3 | T = 3 | Mother Initiated "Shift" v's Ch'd Initiated | 1 |
| T = 5 | T = 11 | Verbal — Attention Controls v's | |
| T = 10 | T = 3 | Non-Verbal — Action Controls | 2 |
| T=0; p=.025 (Direct>Prohib) | T=0; p=.025 (Direct>Prohib) | Verbal — Prohibitives v's | |
| T=0; p=.025 (Direct>Prohib) | T=0; p=.025 (Direct>Prohib) | Non-Verbal — Directives | 3 |
| T = 6 | T=0; p=.025 (Imper>Interr.) | Imperatives to Interrogatives | |
| T = 5 | T = 2.5 | Imperatives to Declaratives | |
| T = 3 | T=0; p=.025 (Imper>Moodless) | Imperatives to Moodless ( Verbal ) | |
| T = 6.5 | T = 3 | Interrogatives to Declaratives | 4 |
| T = 7 | T=0; p=.025 (Interrog>Moodless) | Interrogatives to Moodless | |
| T = 4 | T=0; p=.026 (Declar>Moodless) | Declaratives to Moodless | |
| T=0; p=.025 (Manip>Gest.) | T=0; p=.025 (Manip>Gest.) | Gestures to Manipulatives (Non Verbal) | |

Table IX summarizes the comparisons at Levels 1, 2, 3 and 4 for the 25 month group and also for the 15 month group.

## DISCUSSION

The findings of this study indicate that in a play situation where mothers were given the opportunity to take an assertive role, the mothers of young hearing-impaired children do so in an obvious manner. They allow their children to take less initiative in the choice of toys in the play situation than did the mothers of hearing children observed by Schaffer and Crook (1978). This finding obtained for both age groups observed, and this in striking contrast to the behaviour of the mothers of hearing children studied by Schaffer and Crook, who observed that with increasing age the more active and exploratory nature of children's play let to the mothers according them more initiative than was evidenced for the mothers of the younger children.

When the mothers of the hearing-impaired children did take the initiative they did so in the same way as did Schaffer and Crook's mothers of hearing children: that is, by attempting to redirect their children's attention, rather than trying to change their activity. Mothers' controls of their hearing-impaired children's activity were generally reserved until attnetion had been caught and directed. The mothers of the younger hearing-impaired children spent far more time attempting to capture their children's attention than did the mothers of the older hearing-impaired children. This trend is similarly noted for mothers of hearing children by Schaffer and Crook who felt that the younger children tended to fixate on a particular toy, thus making it more difficult for the mothers to attract their attention away to other toys.

When the actual nature of the maternal control techniques is examined it is evident that the mothers of the hearing-impaired children were as verbally directive with older children as with the younger children. This continued directiveness and the high level of maternal initiation of focus of attention, is in accord with other measures of the direction of mothers of hearing-impaired children recorded by Collins (1969), Schlesinger and Meadow (1972), Seitz and Marcus (1976), and Brinich (1980). It is important to emphasize that even in a play situation where the mother was requested to take an assertive role, Schaffer and Crook (1978) still reported evidence

for mutuality in the nature, timing and adjustment of the mother's controls in relation to her infant's age and on-going activity. It would seem that there is less evidence of this in the behaviour of mothers of hearing-impaired children observed in this study.

Leaving aside the grammatical form of the utterances of mothers of hearing-impaired children, further consideration of the verbal and non-verbal control techniques they used indicates that they were more directive than prohibitive for both age groups. That is, when the mother attempted to change the child's focus of attention, she was more likely to do so by a distraction or a subtle re-direction than by telling the child *not* to attend to or *not* to continue a particular activity. This would seem to be a desirable strategy. The fact that the mothers of both age groups used more manipulative controls than gestures indicates they found actual contact with their hearing-impaired child or the object of attention a more productive means of effecting change or maintenance of the child's attention. The fact that the mothers of the younger children used more manipulative techniques than the mothers of the older group may be the non-verbal parallel to their greater use of verbal attention controls when compared to the mothers of the older group. That is, to ensure the effectiveness of the attention control the mother physically manipulated the child or the object being referred to. This could well be a necessary feature of mothers' interactions with their hearing-impaired children.

Whilst the complexity of verbal language was not examined in this study, the grammatical form of mothers' language addressed to hearing-impaired children indicated no differences according to the age of the children observed. The mothers of the fifteen-month-old children used as many interrogative utterances as did the mothers of the twenty-five-month-old group. This also obtained for imperative, declarative and moodless statements. Such a finding is in accord with the observations of Cross (1980) who concluded that the mother's use of language was determined by the receptive abilities of the child and therefore mothers of hearing-impaired children of all ages would be different in their use of language to mothers of normally hearing children. Examination of the relative proportion of imperative, interrogative, declarative and moodless statements by the mothers of the younger group reveals further differences when compared to studies of mothers of hearing children. The more frequent use of imperatives than

interrogatives by mothers in this younger group is in contrast to the percentages recorded by Snow (1977). Snow noted a higher percentage of interrogative than imperative statements for mothers of hearing children of similar age to the ones in this study. However, Anderson (1978) in her study of the mothers of three hearing-impaired children, observed at this age that the percentage of imperatives was higher than the percentage of interrogatives in two cases and approximately equal in the third. On this measure, the present study would seem to be in agreement with previous studies of the language of mothers of hearing-impaired children of similar age (Seitz & Marcus, 1976; Anderson, 1978; Wedell-Monnig & Westerman, 1977). In the play situation used, the explanation for the high incidence of imperatives could well be related to the similarly high incidence of verbal attention controls used by the mothers of the younger group. It would seem that when the mothers of these younger children found difficulty gaining and redirecting their children's attention verbally they were more likely to resort to imperative statements and non-verbally, to physically manipulate the child and/or the object being focussed on.

The language used by the mothers of the twenty-five-month-old group showed no significant within-group differences in the observed frequencies of imperative, declarative, interrogative or moodless forms. Despite the ranking of all data, this finding could be influenced by the fact that the two hearing-impaired mothers in this group did not attempt verbalization of any kind with their children. Although it was evident to the investiagaor that both were capable of verbally communicating with their children, they made virtually no attempt to do so and relied almost entirely on gesture and manipulation to achieve their purposes. Continuing on this point, one hearing-impaired mother[1] did utilize fingerspelling and sign language in exercising verbal control of her daughter's action and attention. It is worth mentioning that the first two hearing-impaired mothers had attended the same school for the deaf in their youth and that this school had placed rigorous insistence on the pupils' use of *oral* as against manual expression of language. It could well be that both mothers subsequently felt unable to provide a manual model for their children in the situation observed.

---

[1] This was the mother of Child Number 1 in the 15 month group.

Anderson (1978) in her study of the mother of Mary at twenty-five months, whilst observing approximately equal percentages of imperative and declarative statements, also noted an increased proportion of question forms addressed by the mother to her hearing-impaired child. Cross (1980) however, in examining the language of mothers of hearing-impaired two-year-olds, records no mean differences in the mothers' use of imperatives or interrogatives, but does find a higher use of declaratives in relation to the other forms.

Although the significance of such differences in comparison to the present study remain un-tested, they point out the observed variability of studies of mother's verbal interactions with their two-year-old hearing-impaired children: the present study indicating that the mothers of the older group are equally likely to use any of the recorded verbal control measures to gain or re-direct their children's attention or activity. It would seem then, that in contrast to the younger group, no definite conclusions can be made in description of the most frequently observed verbal control techniques used by the mothers of the two-year-olds in this study. All than can be said is that verbally they utilized a range of statement forms without particular emphasis on the imperative (as was the case for the mothers of the younger group). As Schaffer and Crook (1978) point out however, the imperative is the most unambiguous verbal control and interrogatives and declaratives can constitute a form of "indirect" command. It is evident from analysis of the transcripts that the mothers of the hearing-impaired two-year-olds employed this less direct approach in their interactions with their children.

The simultaneous verbal and non-verbal coding of mothers' behaviour was found to be advantageous in examining the specific nature of the control techniques used. A case in point involved the mothers of the younger group using a higher proportion of verbal imperatives allied with the frequency of use of non-verbal manipulation to control and direct their children's activity. In general, the verbal and non-verbal behaviors of the mothers were complementary but there were occasions when significant differences were evident. An example of such a difference was noted in the comparison of the two age groups in terms of the mothers' use of directive controls. Whilst the mothers of the younger group were no more verbally directive than the mothers of the older group, they were significantly more directive in the non-verbal mode. Similarly, although not a prime purpose of the study, comparisons of the hearing and hearing-impaired mothers were made possible

by the recording of the mothers' non-verbal behaviors[2]. In these comparisons no significant differences were noted, that is, the hearing-impaired mothers used attention controls as frequently as the hearing mothers, they were no less directive and used as much gesture and manipulation in their non-verbal interactions with their hearing-impaired children. It is felt that without the use of the behavioral coding scheme devised by Schaffer and Crook (1978) many such similarities and differences might well have been overlooked. In general, the more precise description of verbal and non-verbal maternal behaviours at a number of levels has made possible a clearer picture of the specific nature of the control techniques used by mothers with their hearing-impaired children. As shown by the inter-rater reliability estimates, the utilization of the coding scheme, in terms of the discreteness of the categories, presented few problems.

In summary, this study has shown that, in comparison to the mothers of hearing children observed by Schaffer and Crook (1978), the mothers of hearing-impaired children in the same situation were more controlling in their interactions and allowed their children less initiative. Secondly, the mothers of the older group observed were as verbally directive as the mothers of the younger group. The mothers of the older group did however, spend less time attempting to gain the attention of their children. When the grammatical form of the mothers' language was examined there was no evidence of any significant difference between mothers' language addressed to the younger or to the older groups of children. There have been discussed however, a number of important with-in group differences in observations of the mothers' verbal and non-verbal behaviors.

Thirdly, the coding scheme devised by the previous authors was found to be a useful and reliable instrument for more precise description of both the verbal and non-verbal control techniques used by the mothers of hearing-impaired children in this study.

## OVERVIEW

### Limitations

Any study involving young hearing-impaired children, and the present study is no exception in this respect, is susceptible to a number of

---

[2] Because two of the hearing-impaired mothers did not verbalize at all.

limitations. In terms of the recruitment of subjects, the willingness of parents to co-operate in the study is a possible source of bias, but given the small population of hearing-impaired children of the ages observed this effect would seem to be minimal in the current study. The inclusion of the three hearing-impaired mothers was a choice taken because the researcher was faced with the problem of selecting a truly representative sample of mothers or of selecting a homogeneous group fitting rigid and limiting criteria. A further reason for including the hearing-impaired mothers was the size of the pool from which subjects could be drawn. The admitted limitation in this is that although hearing-impaired children of hearing-impaired parents represent only 10% of the deaf population, they represent 25% of the sample in this study. Also in relation to this sample, the imbalance of males to females could be a further source of bias. This is particularly evident for the older group which was comprised of four boys and only two girs.

The etiology of the children's deafness was a factor that was not examined in any great detail but it is evident that some etiologies have a higher probability of undiagnosed additional disabilities. On this point, the reliance of the investigator on the school and teachers' reports that the children were at least normal intellectually, could be questioned. There is however evidence, that teachers' judgements in studies of this kind, are relatively accurate (Meadow, 1978). No measures of the complexity of the mothers' language were made in this study as the collection of such information was not within the initial purposes of the study. In retrospect, data on MLU could have been used to make comparisons to other studies of the language of mothers of hearing and hearing-impaired children. Additionally the inclusion of an age-matched sample of normally hearing children and their caregivers could have permitted more comparisons than were possible to the limited information provided by Schaffer and Crook.

Some concern must also be expressed about the number of recording venues that were necessitated by geographic distribution of the subjects, particularly as much of the recording was done at parent guidance centres. Belsky (1977) noted that the effect of setting was significant in observations of mothers' interactions with their children, to the extent that they talked to, attended to, responded to and stimulated their children more frequently in the clinical "laboratory" situation than at home.

Finally, the effect of the task instructions on the mothers could be questioned, in that they were requested to encourage their children to play with as many of the toys as possible. Although this was done to highlight the mothers' range of control techniques, their behavior could well have been altered by the perceived demand characteristics of the task and situation. However, as has been stated previously, Schaffer and Crook still found evidence for mutuality even when the mothers were asked to take this more active role.

Theoretical Implications and Further Research

The present study has heightened the authors' concern in relation to the small number of multt-subject and single-subject studies of the early social development of hearing-impaired children, in particular, those concerned with examining the nature of the relationship between the infant and its caregiver. The lack of such studies is really not surprising as this field is an emerging one where related studies of normally hearing children and their caregivers are still examining dyadic characteristics at different developmental stages and the respective contributions that mother and child make to interactions. There has been however, for some time a growing awareness that many developmental issues can be examined by studying the development of hearing-impaired children (Furth, 1961; Cross, 1980) and because of this some information on this group has been obtained. In terms of the ages observed, the present study represents one of few studies of mothers and their nearing-impaired children, in particular the age of the younger group examined. There is obviously a need for many more studies of this type especially with younger children to document the effect of hearing-impairment on the socialization process.

Where the child is not handicapped, it is obvious that a considerable responsibility lies with its caregiver to ensure that the infant's early social experience is suitably structured. This study, in conjunction with previous literature (Schlesinger & Meadow, 1972; Brinich, 1980) has shown that the mother of the hearing-impaired child is more controlling in interactions with her child. Evidence is needed as to whether this is in response to a natural demand felt by the mother, or as Schlesinger and Meadow (1972) suggest, in response to the "training" received by mothers from "experts (p. 109)" in the handling and socialization of hearing-impaired

children. Further studies of this kind have importance for all services concerned with assisting the caregivers of young handicapped children. The behavior has also been demonstrated in the present study. A particular point in this respect could be questioning the appropriateness of the high degree of mothers' physical manipulation of the child and his immediate environment. The behavioral coding scheme devised by Schaffer and Crook has value for other investigators and practitioners in the field as it can provide detailed information of the mother's behavior in interacting with her hearing-impaired child. Difficulty still remains in relation to judgments of the appropriateness of adaptations in maternal style, and also as to realistic expectations of producing changes in maternal style through intervention.

In view of the findings of the study in relation to the hearing-impaired mothers, further research might well be concerned with comparisons of this group to their hearing peers on a non-verbal basis as well as on previous verbal measures. The measures of the language that mothers addressed to their hearing-impaired children, being in concurrence with those recorded by Cross (1980), further indicate that maternal speech features seem related to the perceived receptive abilities of the child. Research on these measures that is comparable to that with mothers of hearing children, should not always be conducted on the basis of age-matching. It should also include as suggested by Cross matching for linguistic competence at different stages, of the hearing to the hearing-impaired children.

Finally, in consideration of the control techniques used by mothers of hearing-impaired children, the conclusions of Schaffer and Crook (1978) seem particularly appropriate.

> "Socialization thus emerges as a process based on mutuality. It is not arbitary imposition by a powerful being on another, utterly passive being. If a mother wishes to bring about some change in her child she needs to start within the context of his own behaviour (p. 77)".

When a mother finds it difficult to establish reciprocal communication with her child because of his hearing-impairment (or mental retardation) her adaptation to that situation may well be through emphasizing control of the relationship with her child.

## REFERENCES

Ainsworth, M.D.S., The development of infant-mother attachment. In B.M. Caldwell and H.N. Ricciuti (Eds.) Review of Child Development Research, 3, Chicago : Univ. of Chicago Press, 1974.

Anderson, B.J. Parents' strategies for achieving conversational interactions with their young hearing-impaired children. In A. Simmons-Martin & D.R. Calvert (Eds.) Parent infant intervention, New York : Grune and Stratton, 1978.

Belsky, J. Mother-infant interaction at home and in the laboratory : The effect of context. (ERIC Document No. ED136944), 1977.

Bondurant, J. An analysis of mothers' speech provided to children with normal language as compared to mothers' speech provided to children with delayed language. Unpublished doctoral dissertation. University of Cincinatti, 1977.

Bowlby, J. Making and breaking of affectional bonds. London : Tavistock, 1979.

Brinich, P.M. Childhood deafness and maternal control. Journal of Communication Disorders, 1980, 12, 75 - 81.

Buckhalt, J.A., Rutherford, R.B. & Goldberg, K.E. Verbal and non-verbal interactions of mothers with their Down's Syndrome and non-retarded infants. American Journal of Mental Deficiency, 1978, 82, 337 - 343.

Buium, N., Rynders, J., & Turnure, J. Early maternal linguistic environment of normal and Down's syndrome language-learning children. American Journal of Mental Deficiency, 1974, 79, 52 - 58.

Collins, J. Communication between deaf children of pre-school age and their mothers. Unpublished doctoral dissertation, University of Pittsburgh, 1969.

Cross, T.C., Morris, J.E., & Nienhuys, T.C. Linguistic feedback and maternal speech : Comparisons of mothers addressing hearing and hearing-impaired children. Unpublished paper, University of Melbourne, Department of Psychology, 1980.

Glanzer, P.D. & Dodd, P.H. Developmental changes in the language spoken to children. Paper presented at the meeting of the Society of Research in Child Development, 1975.

Goss, R.N. Language used by mothers of deaf children and mothers of hearing children. American Annals of the Deaf, 1970, 115, 3, 93-96.

Gunn, P., Clark, D., & Berry, P. Maternal speech during play with a Down's Syndrome infant. Mental Retardation, 1980, February, 15 - 18.

Lewis, M., & Freedle, W.R. Mother-infant dyad : The cradle of meaning. Princeton, N.J.: Educational Testing Service, 1972.

Marshall, N.R., Hegrenes, J.R. & Goldstein, S. Verbal interactions: Mothers and their retarded children vs. mothers and their non-retarded children. American Journal of Mental Deficiency, 1973, 77, 415 - 419.

Monnig, J., & Westerman, T. Mothers' language to deaf and hearing infants. (ERIC Document No. ED149595), 1977.

Moores, D.F. Educating the deaf : Psychology, principles and practices. Boston, Houghton Mifflin Company, 1979.

Nelson, K. Structure and strategy in learning to talk. Monographs of the Society for Research in Child Development, 1973, 38, 1-135.

Phillips, J. Syntax and vocabulary of mothers' speech to young children: Age and sex comparison. Child Development, 1973, 44, 182-185.

Schaffer, H.R. The growth of sociability. Harmondsworth : Penguin, 1971.

Schaffer, H.R. Early interactive development. In H.R. Schaffer (Ed.) Studies in the mother-infant interaction. London : Academic Press, 1977.

Schaffer, H.R., & Crook, C.K. The role of the mother in early social development. In H. McGuirk (Ed.) Issues in childhood social development, London : Methuen, 1978.

Schlesinger, H.S. & Meadow, K.P. Sound and sign. Berkeley : University of California Press, 1972.

Snow, C.E. Mothers' speech to children learning language. Child Development, 1972, 43, 549 - 565.

Snow, C.E. The development of conversation between mothers and babies. Journal of Child Language, 1977, 4, 1 - 22.

Seitz, S. & Marcus, S. Mother-child interactions : A foundation for language development. Exceptional Children, 1976, 445 - 449.

Turnure, J.E. & Rondal, J.A. Maternal speech to normal and Down's Syndrome children matched for mean length of utterance. Paper presented at the Annual Meeting of the American Association of Mental Deficiency. Chicago, May, 1976.

Wulbert, M.S., Inglis, E., & Mills, B. Language delay and associated mother-child interactions. Developmental Psychology, 1975, 11, 61-70.